Reducing Hazardous Waste and Hazardous Substances in Washington

1996 Annual Progress Report

Washington State Department of Ecology
Hazardous Waste and Toxics Reduction Program
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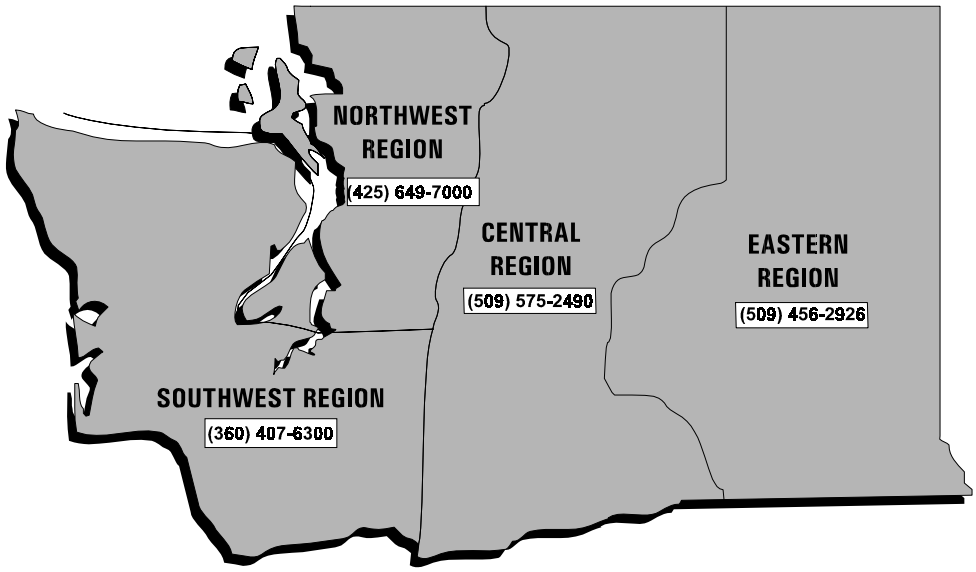
The Hazardous Waste and Toxics Reduction Program is responsible for the management and reduction of hazardous waste and toxic substances in Washington State. We are available to answer your questions. Contact your nearest regional office and ask for a Toxics Reduction Specialist for information on reducing or recycling hazardous waste. And if you are uncertain about your responsibilities as a hazardous waste generator, ask for a Hazardous Waste Specialist.



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Chapter 1 — Introduction

Purpose of the Report

This annual report provides information on the progress being made in reducing hazardous wastes and hazardous substances in Washington. The report is intended to update the appropriate legislative environmental standing committees and other interested parties on progress toward implementing the Hazardous Waste Reduction Act, Chapter 70.95C RCW. The report covers progress during calendar year 1996.

Program Overview

The 1990 Hazardous Waste Reduction Act established a goal to reduce hazardous waste generation by 50%. The primary means for achieving this goal is through implementation of a pollution prevention planning program, also established in the Act. Facilities that generate in excess of 2,640 pounds of hazardous waste per year, or who are required to report under the Toxic Release Inventory (TRI) of the Emergency Planning and Community Right to Know Act of 1986, are subject to this law. Some 600 facilities in Washington currently participate in this planning program.

Pollution prevention planning is an activity that involves:

- ✔ inventorying hazardous substances used and hazardous waste generated;
- ✔ identifying opportunities to prevent pollution;
- ✔ analyzing the feasibility of these prevention opportunities; and
- ✔ setting goals for hazardous substance use reduction and hazardous waste reduction, recycling and treatment.

Ecology also promotes pollution prevention through initiatives other than planning. Several campaigns targeting specific industries have been conducted and more are being planned. These campaigns focus on pollution prevention and regulatory compliance assistance, and help target future technical assistance. Information on recent campaigns is provided in Chapter 3.

Pollution prevention has emerged as a key strategy for protecting the environment. Business, industry and government alike recognize the benefits of prevention rather than end of pipe controls. Many factors, including regulatory compliance, cost savings, worker safety and reduced liabilities help validate pollution prevention as an approach to be incorporated into all business practices.

Exotic Metals Forming *in Kent reduced hazardous substance use by 1,600 pounds in 1996 to give them a total of over 23,000 pounds reduced over the five year life of their P2 Plan. This was 96% of their original goal. They also reduced hazardous waste by 10,150 pounds, or 112% of their goal.*

Chapter 2 — Measuring Pollution Prevention Progress

Progress Toward the 50% Policy Goal

Aero Controls *targeted the use of methyl ethyl ketone, a known carcinogen, in their Auburn plant. In 1993 they used 1,960 pounds for cleaning and mixing. By intensive training, changing processes and procedures, and finding alternative materials, they were able to reduce the amount used to 560 pounds in 1996. This reduction was made at a time when they increased production by 75% over 1993 levels.*

The Hazardous Waste Reduction Act contains a statewide policy goal to reduce hazardous waste generation by 50%. This goal was directed toward all hazardous waste generators, not just planning facilities. The goal equals 128 million pounds, which is 50% of the 255 million pounds generated by all facilities in 1990. Annual Dangerous Waste Reports, filed by all generators, are used to view waste management trends over time. Generation trends, particularly when adjusted for changing economic conditions, provide a measurement of progress toward the 50% goal.

Figure 1 charts hazardous waste generation levels for 1990 through 1996. The amounts shown are from all generating facilities except commercial treatment, storage and disposal facilities, which manage wastes generated by others. Most waste waters, wastes from clean-up projects and mixed radioactive wastes are also excluded.

The graph in Figure 1 also shows the data adjusted for the changing economy. The adjustments are intended to show estimated levels of waste generation assuming the economy remained constant. This process, called “normalizing” data, makes waste totals more comparable from year to year. The adjustment factors were calculated from information provided by the Department of Revenue. Gross business income from all Washington businesses was the normalization measure used.

In figure 1, generation data show an increase of 6 million pounds from 1995 to 1996, while normalized data show a decrease of 3 million pounds. The generation data does not show how changing levels of production or service can drive changes in waste generation. Growth in business from one year to the next will result in more waste being generated, assuming all other factors remain the same. Normalizing the data for increases or decreases in business levels gives a more meaningful picture of generation trends. In this case, the normalized level of 188 million pounds in 1996, compared to 289 million pounds in 1992, equates to a 35% reduction. Nineteen ninety-two is used as a comparison year because it was the year of highest waste generation and the first year facilities were required to conduct pollution prevention planning.

Figure 1 also shows a projected generation level in the year 2001 that will occur if the waste reduction targets of the facilities submitting pollution prevention plans through 1996 are met. The targets, which total126 million pounds, are subtracted from the base year amount of 255 million pounds to arrive at a projected generation level of 129 million pounds. When compared to non-normalized 1992 data, this achievement would equate to a 59% reduction. Compared to the base year of 1990 this would equate to a 49% reduction. Basing this projection on planning facilities is valid because they generate approximately 96% of the waste.

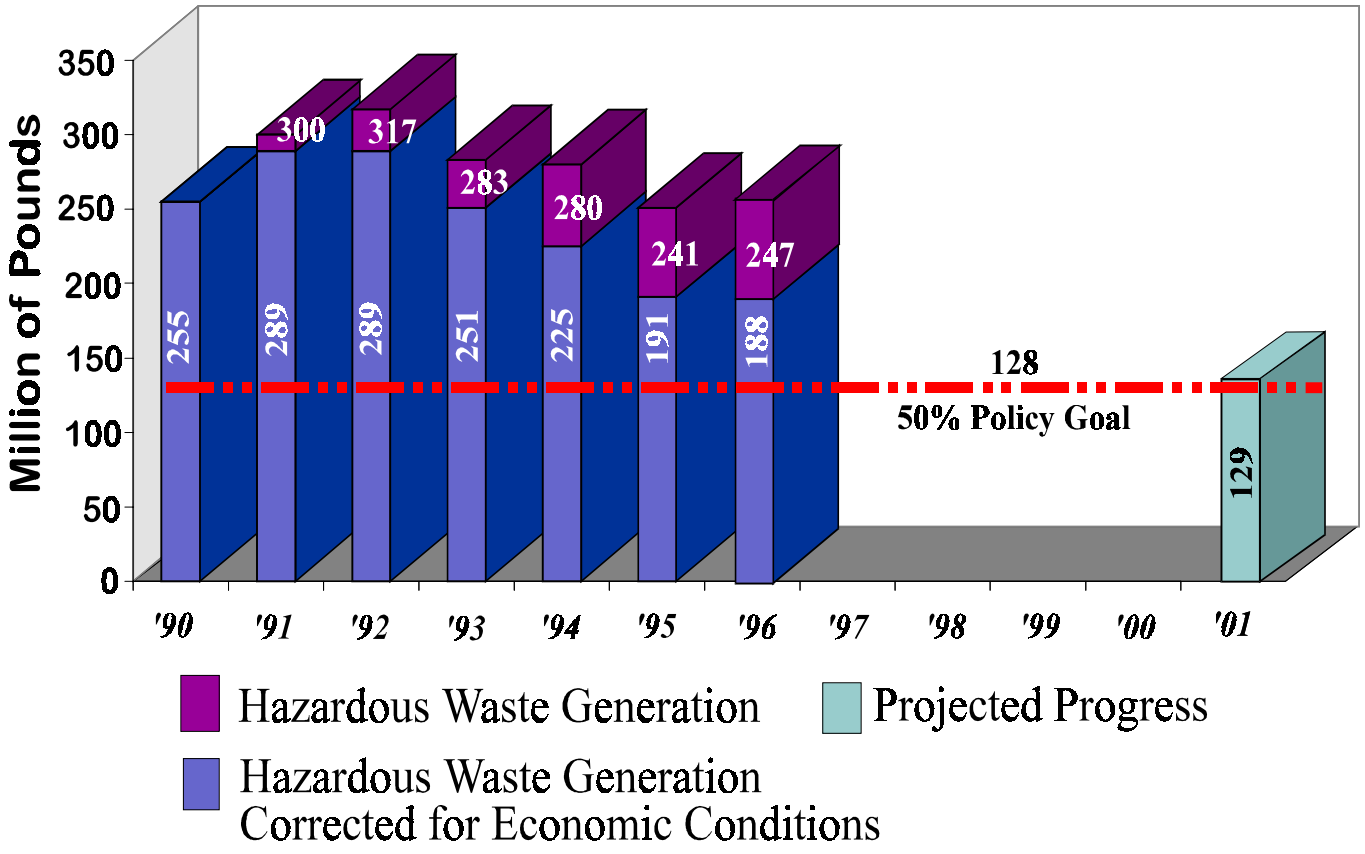

Figure 1
Progress Toward the 50% Waste Reduction Goal

Other Measures of Progress

Another way to measure progress is to look at the information provided by facilities required to prepare pollution prevention plans. Facilities are asked to establish numerical targets for hazardous substance use reduction and hazardous waste reduction, and for the amounts of waste that will be recycled and treated. These targets are normally determined by estimating the effects of implementing pollution prevention projects identified as part of the planning process.

*In year four of their P2 Plan, **Hytek Finishes Company**, a large supplier of specialized metal finishing, anodizing and organic coating services in Kent, after adjusting their figures for production, reported the dramatic reduction of 94% in the use of MEK - a known carcinogen.*

Figure 2 displays the most current targets for facilities submitting plans and Annual Progress Reports from 1992 through 1996.

***Lilly Industries, Inc.**, an industrial paint manufacturer in Seattle, reported a reduction in hazardous waste generation by 3,275 gallons since 1991 saving an average of $1,400 per year. They also reduced wash solvent by 7,282 gallons over the same period, saving an average of $600 a year. All told, since 1991 their hazardous substance use has decreased by 1,931,313 pounds. They say their results include less employee exposure and reduced air emissions.*

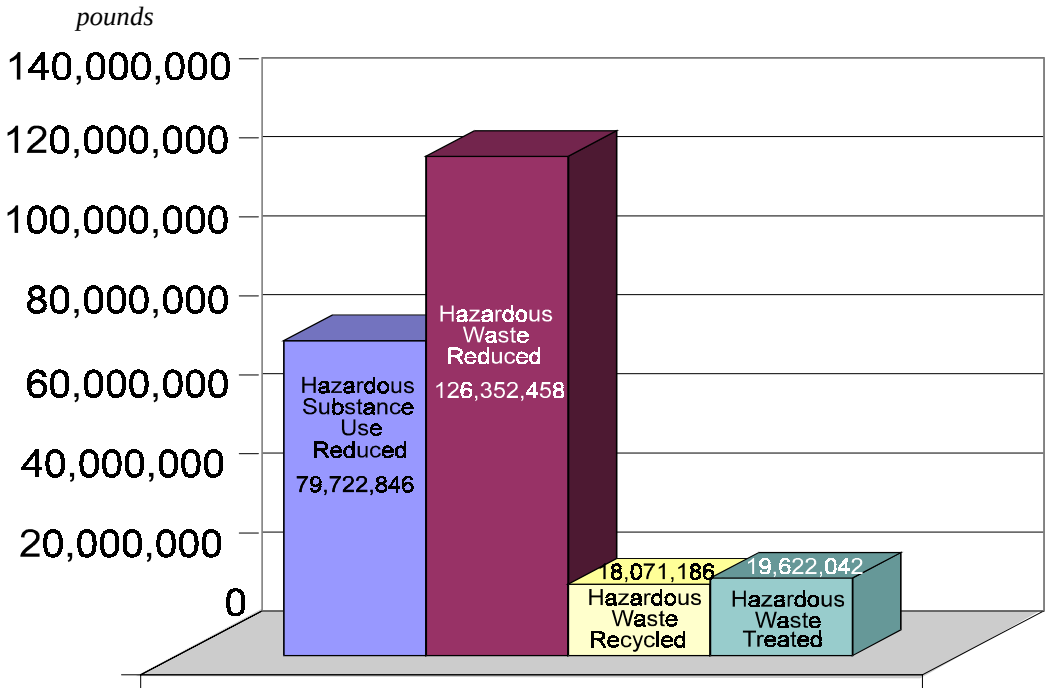

Figure 2
Pollution Prevention Targets (Goals)

While planning is mandated, plan implementation is voluntary on the part of the planning facilities. Facilities that establish targets provide a clear indication that they are committed to implementation. In fact, Annual Progress Reports tell us that 778 individual pollution prevention projects were implemented during 1996. The actions from these projects had resulting effects in the categories listed: (note – implementation of a project can have multiple effects, so the total effects will exceed the number of projects implemented).

Reducing hazardous substances used	347
Reducing hazardous waste generated	447
Increased recycling of waste	169
Increased treatment of waste	55
Reduced air/water emissions	164
Cost savings	357
Total	1,539

Chapter 3 — Program Highlights

General Technical Assistance

Providing technical assistance to businesses is a major component of the Hazardous Waste and Toxics Reduction Program. Ecology receives many requests for assistance. Help provided to facilities saves them significant amounts of money each year, increases their regulatory compliance rates, and decreases their liabilities. Some examples of the types of assistance provided include:

- ✔ Help conduct reviews of hazardous substance use and hazardous waste generation.
- ✔ Help overcome technical, economic and regulatory barriers to implementing pollution prevention projects.
- ✔ Help businesses safely manage hazardous waste.
- ✔ Assist with cost analysis of pollution prevention opportunities.
- ✔ Share ideas and techniques on alternative process technologies.

During 1996, technical assistance was provided in several ways:

- ✔ 332 site visits to planners and non-planners
- ✔ 6,680 phone consultations to planners and non-planners
- ✔ 29 workshops, attended by 1,161 participants
- ✔ regular distribution of newsletters and other publications

Directed Technical Assistance

Additional insights into effective waste management practices surface as Ecology works with specific industry sectors or implements special projects. Focused technical assistance efforts for these sectors and projects provide the opportunity to collect information on how improved management practices can reduce environmental impacts. Last year Ecology was involved with several successful efforts.

Toxics Reduction Engineer Exchange (TREE) Project

The idea behind the TREE Project is that implementation of pollution prevention opportunities is driven by profit, and to a lesser extent, long-term security. TREE supports this idea by providing in-depth engineering assistance and economic analysis.

During the last year, TREE supplied three companies with a small team of engineers to perform a comprehensive Waste Reduction Assessment. The Waste Reduction Assessment (WRA) provides a mass balance and process model, identifies pollution prevention (P2) opportunities, shows the economic impact of these opportunities, and includes a compliance audit and analysis of business performance. A strategy for investing the savings resulting from P2 is then developed to strengthen the business financial performance. These findings are presented to the facility in a comprehensive report.

*Over the five-year life of their plan, **Boeing Plant 2** 737 / 757 Programs in Renton reduced hazardous substances by over 2.4 million pounds and reduced hazardous waste more than 13.9 million pounds. This success was more than eight times the goals set in their pollution prevention plan. Success on this level only comes with persistent commitment to pollution prevention implementation.*

Wrap Pack Corporation *produces wrap tissue for pears and apples. After a visit from an Ecology toxics reduction specialist the company looked for and found ways to eliminate all its hazardous wastes. The Yakima company eliminated toxic cleaning agents and changed its lubrication handling practices. Wrap Pack found that a by-product of all these programs, which were inexpensive to start, has been monetary gain and increased worker satisfaction.*

The three TREE Projects are described below:

Industrial Plating Corporation, Seattle - By reducing drag-out and improving rinsing efficiency, IPC was able to reduce water use from over 40,000 gallons per day (GPD) to less than 8,000 GPD (an 80% reduction) in the first month. The revised process improved wastewater treatment and compliance, and reduced dangerous waste generation by 92 million pounds. A cursory economic analysis indicates savings of $244,000 per year on a capital investment of $40,000. The payback for the project is 59 days. Pre-tax profits could increase by as much as 13%.

Novation Incorporated, Spokane - By improving process and rinsing efficiency, Novation reduced water use from nearly 50,000 GPD to less than 5,000 GPD. This was accomplished in a very short time. Projected cost savings are estimated to exceed $200,000 on an investment of $33,000, a payback of 61 days. Dangerous Waste generation could decrease by 80 million pounds per year. Pre-tax profits may increase as much as 10%.

Johnson Matthey Electronics, Cheney - This project differed from the first two because the factory is under construction. Implementing P2 before construction is the ideal, and is commonly known as "Design for the Environment." Using process modeling, TREE was able to identify the potential for up to an 80-90% reduction in waste water compared to the original design.

The TREE project is evolving into an agency-wide effort. Participation from Water Quality, Air Quality and local governments is being encouraged to broaden the benefits of TREE analyses. Other industries (e.g. food processing) are under consideration for TREE projects.

School Sweeps

Purpose and Goals

The School Sweeps Campaign was launched in the fall of 1995 to address environmental management concerns at Washington State community and technical colleges. The main goals of the project were to improve compliance with environmental laws and promote pollution prevention techniques; and to provide tools to train students in waste management training techniques for their occupations.

Allied Signal Avionics *in Redmond changed their procurement process for small quantity chemicals in 1996 thus eliminating the purchase of chemicals already in stock and preventing the purchase of larger than needed quantities. This reduces the quantity of these chemicals that must be disposed of in labpacks – a more costly manner. After the startup of a wastewater evaporation system they achieved a reduction in hazardous waste generation of approximately 11,000 pounds per year. When combined with their accomplishments in prior years they surpassed the goals in their five-year Pollution Prevention Plan.*

Project Implementation

All 32 community and technical colleges in Washington State and two private institutions participated in the campaign. King County hazardous waste experts and other local government agencies joined Ecology on the School Sweeps technical assistance project.

The project had three major components:

- ✔ Perform a campus environmental assessment to help the schools comply with environmental laws
- ✔ Provide assistance to laboratory instructors on chemical storage and disposal
- ✔ Enhance vocational program curricula with pollution prevention techniques

Project staff visited every college to provide assistance on how to comply with Washington's hazardous waste regulations and made recommendations on how to reduce waste. The colleges were visited again a year later to assess progress.

Results

As a result of the technical assistance outreach campaign, as of July 1, 1997 colleges had corrected 87 percent of the compliance-related suggestions. Seventy-five percent of the recommended management practices that are not required by law were also instituted.

College science laboratory instructors received training and assistance on proper chemical segregation and waste management. As a result, campus laboratories have eliminated many of the risks associated with chemical storage and use, and have properly disposed of excessive and unusable chemicals.

Environmental competencies, or skill standards, were written for automotive repair, auto body repair, dental programs, photography and x-ray, and the carpentry and cabinetry vocational programs. The competencies were developed to give students environmental management skill standards to take into their chosen professions. These standards are now taught as part of the program curriculum.

More information is provided in the School Sweeps Project Final Report, publication #97-438, available from the Department of Ecology.

*Seattle's **Northwest Cooperage Company, LLC**, has participated in P2 Planning since 1992. They exceeded their own expectations by accomplishing 170% of their five-year goal. They state as a result of the program their adjusted cost savings for 1996 over the 1991 base year was $104,775 just for hazardous substances alone.*

Integrated Pest Management

Scope of Project

Ecology conducted a pilot project to promote the use of Integrated Pest Management (IPM) in elementary and secondary schools during the 1996 and 1997 school year. Integrated pest management helps prevent pest problems, and establishes strategies that consider such factors as human health, ecological impacts, and cost-effectiveness. The IPM project goals were to inform school officials and support staff about chemical-free methods of pest control and to train the appropriate school employees to incorporate IPM principals into their daily work.

Schools Contacted

As of the end of the 1996-1997 school year, direct visits were made to 65 schools in 13 districts in Spokane, Grant, King, and Pierce Counties. Ecology staff and volunteers also visited with management personnel who represent 300 schools in these districts. Each school that wanted to participate in the project filled out surveys about their pest problems and existing pesticide policies before the site visits.

Staff

The IPM site visits were a collaborative effort. Ecology employees and volunteers from WSU's Cooperative Extension Master Gardener program and the American Lung Association's Master Home Environmentalist program visited the schools during the spring of 1997 to provide an introduction to IPM to school maintenance staff.

Example Visit

The volunteers visiting the schools were asked to strongly recommend that the school or school district establish a formal IPM policy and include IPM specifications in contracts with commercial pest control companies. At the end of the visit, the volunteers left binders with IPM reference materials collected and prepared by the Department of Ecology. They also left an Ecology document "Cost Analysis of Pest Control Methods" which describes some ways to compare the costs of traditional pest control methods with IPM methods.

Follow Up Activities

During the coming year selected schools will be contacted to evaluate the usefulness of the visits and the material provided. We will also ask if the school has developed or is developing an IPM policy.

Naval Undersea Warfare Center – Keyport *pursued a target of 50 percent reduction in hazardous substance use and the generation of hazardous waste by the end of 1995. In the first five-year effort, Keyport achieved an overall hazardous waste reduction of almost 57%. Keyport expects to further reduce hazardous waste by 30% during the life of their next five year Pollution Prevention Plan.*

The ***Crowley Marine Services Pier 17*** *facility in Seattle reports that the use of less toxic solvents, correctly sized containers, reduction in inventory, and worker education have greatly increased worker safety as well as reducing Crowley's long term liability for waste disposal. They further state that vessel and shore-side personnel now perceive the pollution prevention program as a means to improve worker safety.*

Chapter 4 – New Initiatives

In response to changing business practices and needs, Ecology continues to implement new programs and target specific industrial sectors for technical assistance. A significant change initiated last year provided an innovative alternative approach to pollution prevention planning. Work with additional industrial sectors is also underway.

Environmental Management Systems

Ecology now offers a new alternative to facilities required to prepare a five-year update to their original Pollution Prevention (P2) Plan. The Environmental Management System (EMS) Alternative to P2 Planning allows a facility which has a functioning environmental management system to substitute documentation of that system for preparation of a five-year plan update. The facility must document how their system meets a set of pre-defined pollution prevention criteria, and agree to an on-site visit by Ecology staff before they are approved for this alternative. EMS Alternative facilities are still required to prepare an annual performance report to Ecology, which will report on progress toward achieving pollution prevention goals.

This alternative to traditional P2 Planning was designed in part to accommodate facilities that have a highly developed environmental management system and/or are pursuing certification through ISO 14001. If these facilities can adequately demonstrate how their system meets the P2 criteria, it eliminates the need to prepare what would likely be a redundant P2 Plan. One of the hallmarks of environmental management systems is the emphasis on continuous improvement. A facility must demonstrate continuous improvement in identifying and implementing pollution prevention opportunities to have Ecology accept their application for this alternative planning approach. To date, 15 facilities have been approved for the EMS alternative.

Industry Sector Campaigns

The Hazardous Waste and Toxics Reduction (HWTR) Program has begun a second round of targeted industry sector technical assistance projects. In 1998, the paint manufacturing industry and military bases in Washington will be a focus of specific studies to identify, analyze and respond to needs unique to these sectors. The intent of these projects is to enable paint manufacturers and military bases to reduce the use of hazardous substances and the generation of hazardous wastes by working with the industry to meet their needs and by providing a wide variety of technical assistance.

*During their first five-year planning cycle, the **Boeing Renton, North Boeing Field, and Thompson Site** facilities reduced hazardous substances by over 1.8 million pounds and reduced hazardous waste more than 3.6 million pounds. This exceeded the goals set in their plan more than 100 percent. Boeing Renton's commitment to pollution prevention implementation really paid off.*